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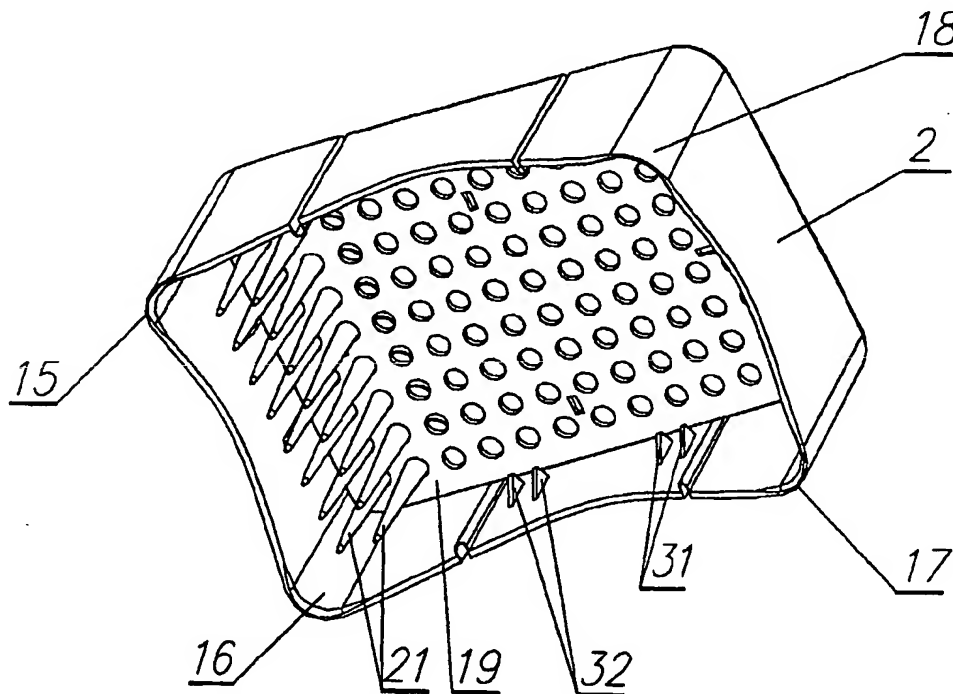
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(54) Title: PIPETTE TIP CONTAINER



(57) Abstract: Pipette tip container comprises a base for setting a tray (19) with tips (21) and a cover being a tray feeder (2), wherein two opposite elastic side walls of the feeder (2) have on their inner side wedge-shaped projections (31, 32) for the tray (19) with tips (21).

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PIPETTE TIP CONTAINER

(Background of the Invention)

1. Field of the Invention

This invention relates to the pipette tip container, in particular to a container structure for transfer and storage of pipette tips.

2. Description of the Related Art

The U.S. patent No. 3,937,322 discloses a package of disposable pipette tips in which the tips are supported on trays and trays with tips are stacked one upon another. A stack of such trays is secured on a support and placed into a box.

The U.S. patent No. 5,441,702 discloses a refill pack for pipette tip racks, which comprises releasing means coupled with locking means, for downward setting tip tray from holding means into empty pipette tip rack. Moreover, releasing means comprise elements to secure locking means comprising a support plate coupled with the cover and to separately release the support plate and tray with tips from holders for re-filling empty tip rack when it is placed in the pack.

In the example embodiment of the invention submitted in this patent description, a tip packaging is disclosed which comprises a horizontal plate supporting tips, and manually tightened carrier comprising a cover and releasable snap fastener elements for releasable fastening the tray to the cover. The cover constitutes a shallow container made of light, thin, elastic plastic material, and includes horizontal, elastic cover, and side elements with releasable snap fastening elements for the tray, shaped like the letter "S". The pack user carries it upon the top part of an empty rack. Next the user presses

downwards the top part of the elastic cover to release snap fastening elements, and detach the tray from the container, and set tips in the rack.

Further, the U.S. patent No. 5,366,088 discloses a stackable pipette tip rack formed so as to lockably set itself in another pipette tip rack of the same design, and hold pipette tips in upward position. In the disclosed design, on side walls near the top surface of the rack for tips, holes are disposed to operate with projections of the next rack placed on this rack. In particular, the side walls comprise a lockable mechanism comprising an lever part or articulated element. The articulated element is fixed to the wall by the means of two hinge elements making an element rotating around an axis passing through the hinges, whereas a projection is disposed along the lower part of the articulated element.

(Summary of the Invention)

According to the present invention, a the pipette tip container comprises a base for setting a tray with tips and a cover being the tray feeder, where two opposite elastic side walls of the feeder have on their inner sides wedge-shaped projections for tip tray.

In the pipette tip container according to the invention, the opposite side walls have elastic holders with wedge-shaped projections.

In the pipette tip container according to the invention, the wedge shaped projections abut against side walls of the base.

In the pipette tip container according to the invention, the base has corner guides protruding above its top surface on which trays with tips are superimposed.

In the pipette tip container according to the invention, the feeder has protruding corners, which lower edges are below tips placed therein.

In the pipette tip container according to the invention, the feeder has elastic links between side walls and elastic holders.

In the pipette tip container according to the invention, opposite base side walls have groves for elastic feeder links.

In the pipette tip container according to the invention, the tray has rings around holes, on upper edge of which short tips are set.

In the pipette tip container according to the invention, the feeder top part has an inner stabilising ring surrounding upper portions of long tips, outside diameter dimension of which is close to the spacing of holes in the tray.

In the pipette tip container according to the invention, the base has in its lower part an additional bottom base to house the lower ends of long tips.

An advantage of the solution according to the present invention is a fact that the invention enables – by the use of the feeder, to take and carry trays with tips upon the container base, and next to close the container with the feeder which simultaneously is the container cover.

(Brief description of the drawings)

The accompanying drawings, which are incorporated in, and form a part of the specification, illustrate an embodiment of the present invention and, together with the description, serve to explain the principles of the invention. In the drawings:

Fig. 1 shows general view of the container as per the invention;

Fig. 2 shows the container consisting of a base and a feeder;

Fig. 3 shows the base with a tray and pipette tips viewed from top and front;

Fig. 4 shows the tray feeder viewed from bottom and front;

Fig. 5 shows the feeder from the Fig. 4 with a tray and tips;

Fig. 6 shows vertical section of the feeder with the tray and tips the Fig. 5;

Fig. 7 shows the base with a tray and short tips viewed from top and front;

Fig 8 shows vertical section of the feeder with the tray and short tips from the Fig.

7;

Fig. 9 shows the base with a tray and pipette tips viewed from top and front;

Fig 10 shows vertical section of the feeder with the tray and long tips from the Fig. 9; and

Fig 11 shows a series of stacked trays with pipette tips.

(Detailed description of the Invention)

Reference will now be made in detail to the preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings.

The container shown in Fig. 1 includes a base (1) and a cover superimposed on it constituting the feeder (2) for trays with pipette tips. The base (1) has, as it is shown in Fig. 2, rigid side walls (3, 4, 5, 6) as well as corner guides (7, 8, 9, 10) protruding above its upper surface, upon which trays with tips are placed. The base (1) has in its upper portion fins (11) with stabilising pins (12). Moreover, two opposite side walls (3, 5) of the base (1) have groves (13, 14). In turn, the feeder (2) has disposed out corners (15, 16, 17, 18), lower edges of which are positioned below tips placed therein. In the base (1) a tray (19) is positioned with plurality of holes (20) for pipette tips (21), as it is shown in Fig. 3

Fig. 4 illustrates the feeder (2) which is built from flat and preferably rigid upper portion (22) and four side walls (23, 24, 25, 26), whereas two opposite side walls (23, 25) have elastic holders (27, 28) in their middle portion. Elastic holders (27, 28) are joined with the side walls (23, 25) by the means of elastic links (29, 30), and they have wedge-shaped projections (31, 32) on the feeder (2) inner side.

When the feeder (2) is positioned on the tray (19) with tips (21), and the feeder (2) is pressed downwards, the tray (19) with tips (21) nests in the feeder (2) in a stabile manner so that it is supported on wedge-shaped projections (31, 32), while the top portions of the tips (21) abut against the top part (22) of the feeder (2), as it is shown on a view in Fig. 5 and on a section in Fig. 6.

Next the tray (19) may be displaced and set – by the use of the same feeder (2) – in another base shown in Fig. 2. To achieve this, the feeder (2) with the tray (19) and pipette tips (21) are set in the base (1) by sliding corners (15, 16, 17, 18) of the feeder (2) on corner guides (7, 8, 9, 10) of the base (1). When the feeder (2) is pressed downwards,

edge-shaped projections (31, 32), which abut against side walls (3, 5), decline sideways together with the elastic holders (27, 28) and release the tray (19) with tips (21). The tray (19) is stable set in the base (1) by the use of stabilising pins (12) in the base (1) and corresponding stabilising holes in the tray (19), as it is shown in relation to Fig. 3. This way the tray (19) with tips (21) is prepared for analytical tests, whereas it is then possible to place the feeder (2) on the base (1) and to close the container with tips (21).

In case of using short tips (33), which flange length is shorter than the distance between the tray (19) and the upper portion (22) of the feeder (2) as compared to tips (21) shown in Fig. 6, in order to stabilise their position in the feeder (2) by abutting against upper portion (22) of the feeder (2), the tray (19) has rings (34) around holes, on which upper edges short tips (33) are set, as it is shown on a view in Fig. 7 and on a section in Fig. 8.

In turn, for long tips (35), which flange outside diameter dimension is close to the spacing of holes in the tray (19), for the sake of stabilising their position in the feeder (2), the upper portion (22) of the feeder (2) has internal, preferably rectangular stabilising ring (36) which surrounds all upper portions of long tips (35). Moreover, the height of a side wall of the feeder (2) is adjusted to the flange length of long tips (35), while the base (1) has in its lower portion an additional bottom base (37) to house lower parts of long tips (35), as it is shown on a view in Fig. 9 and on a section in Fig. 10.

Pipette tips (21) are supplied in a bulk container which contains, as it is shown in Fig. 11, a stack of trays (19) with holes (20) placed one upon another, wherein tips (21) are set. From this stack by the use of the feeder (2) subsequent trays (19) with tips (21) are taken, beginning with the topmost tray (19), and they are carried onto the base (1).

We claim:

1. Pipette tip container comprising a base (1) for setting a tray (19) with tips (21) and a cover being a tray feeder (2), characterised in that two opposite elastic side walls (23, 24) of the feeder (2) have on their inner side wedge-shaped projections (31, 32) for the tray (19) with tips (21).

2. The container according to the claim 1, characterised in that the opposite side walls (23, 24) have elastic holders (27, 28) with wedge-shaped projections (31, 32).

3. The container according to the claim 1, characterised in that the wedge-shaped projections (31, 32) abut against opposite side walls (3, 5) of the base (1).

4. The container according to the claim 1, characterised in that the base (1) has corner guides (7, 8, 9, 10) protruding above its top surface, upon which trays (19) with tips (21) are placed.

5. The container according to the claim 1, characterised in that the feeder (2) has protruding corners (15, 16, 17, 18), which lower edges are below the tips (21) placed therein.

6. The container according to the claim 2, characterised in that the feeder (2) has elastic links (29, 30) disposed between its side walls (23, 25) and elastic holders (27, 28).

7. The container according to the claim 6, characterised in that the opposite side walls (3, 5) of the base (1) have groves (13, 14) for elastic links (29, 30) of the feeder (2).

8. The container according to the claim 1, characterised in that the tray (19) has rings (34) around holes, on which upper edges short tips (33) are set.

9. The container according to the claim 1, characterised in that the upper portion (22) of the feeder (2) has an inner stabilising ring (36) surrounding the upper portions of long tips (35) outside diameter dimension of which is close to the spacing of holes in the tray (19).

10. The container according to the claim 9, characterised in that the base (1) has in its lower portion additional bottom base (37) to house lower portions of long tips (35).

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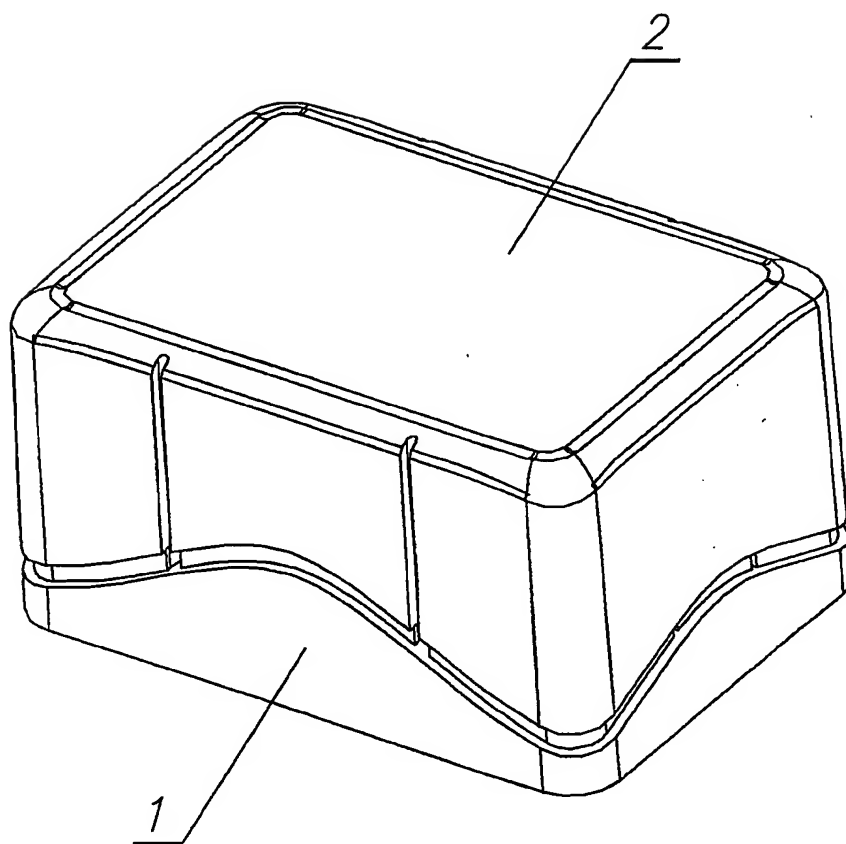


Fig. 1

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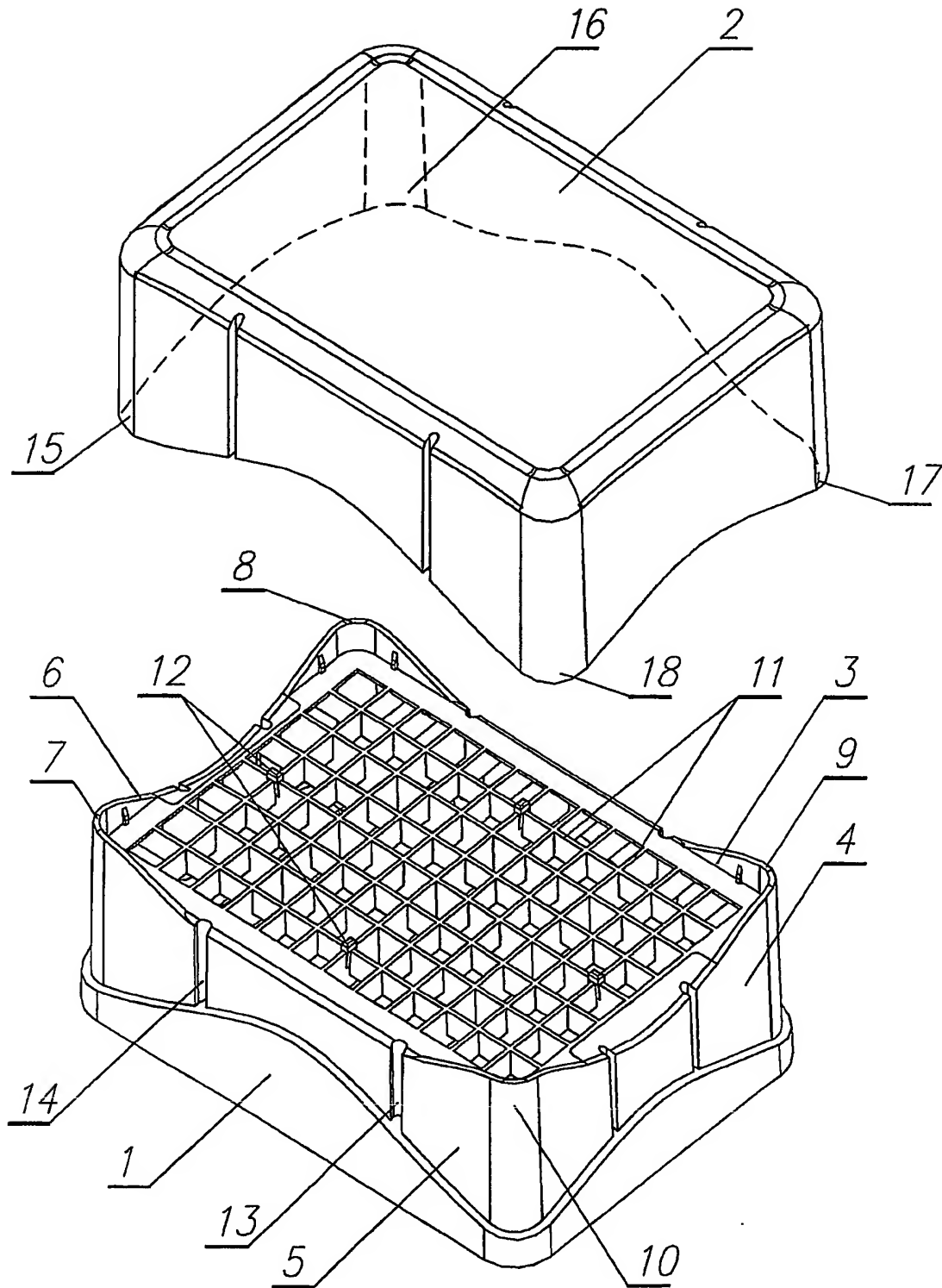


Fig. 2

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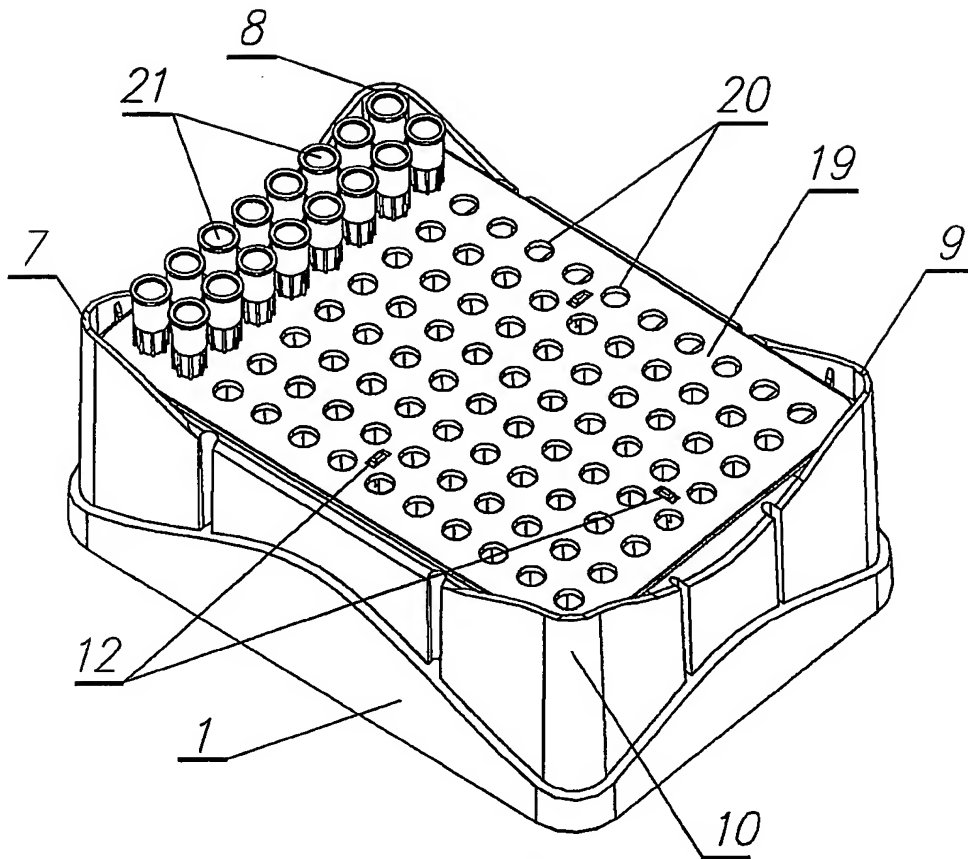


Fig. 3

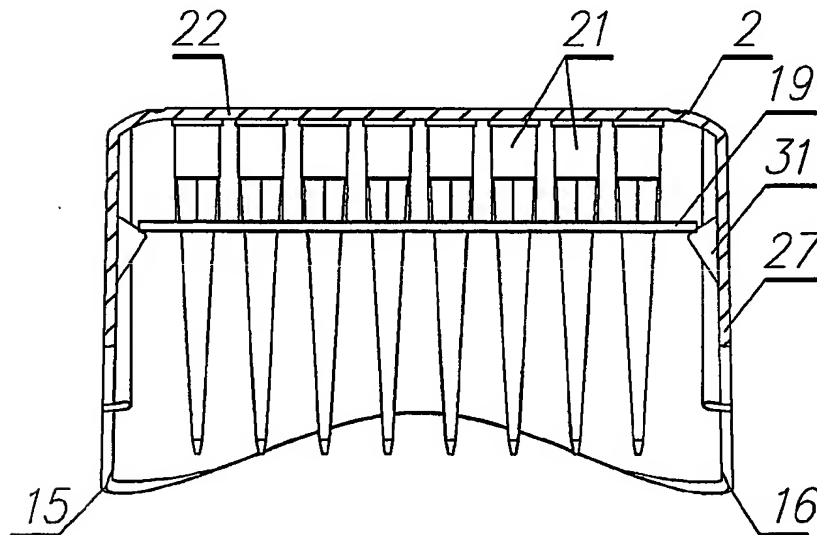


Fig. 6

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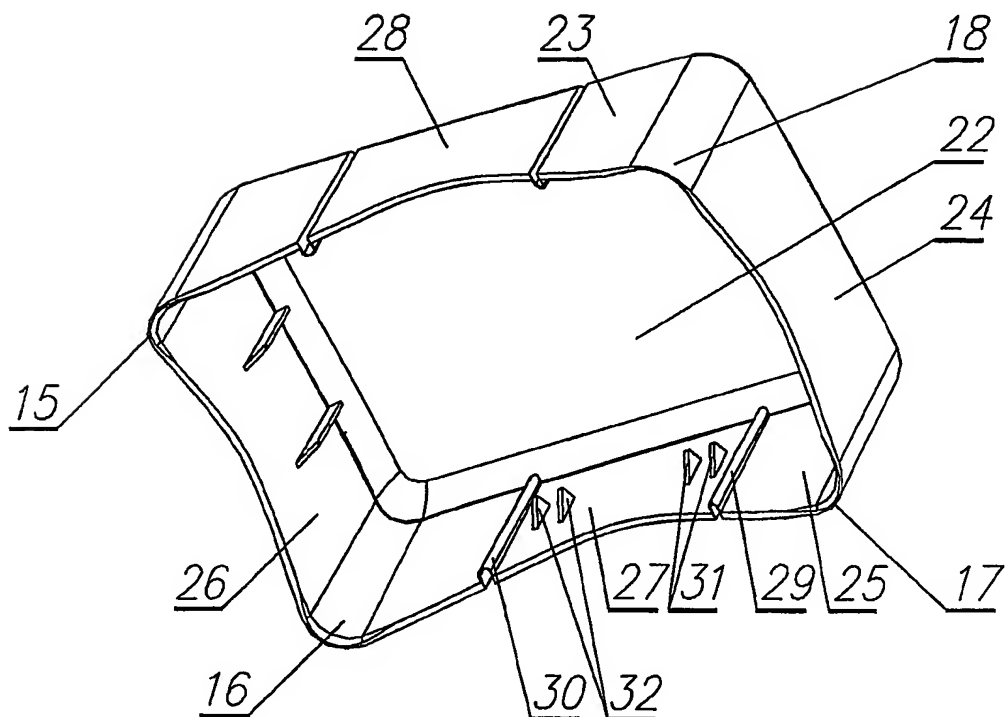


Fig. 4

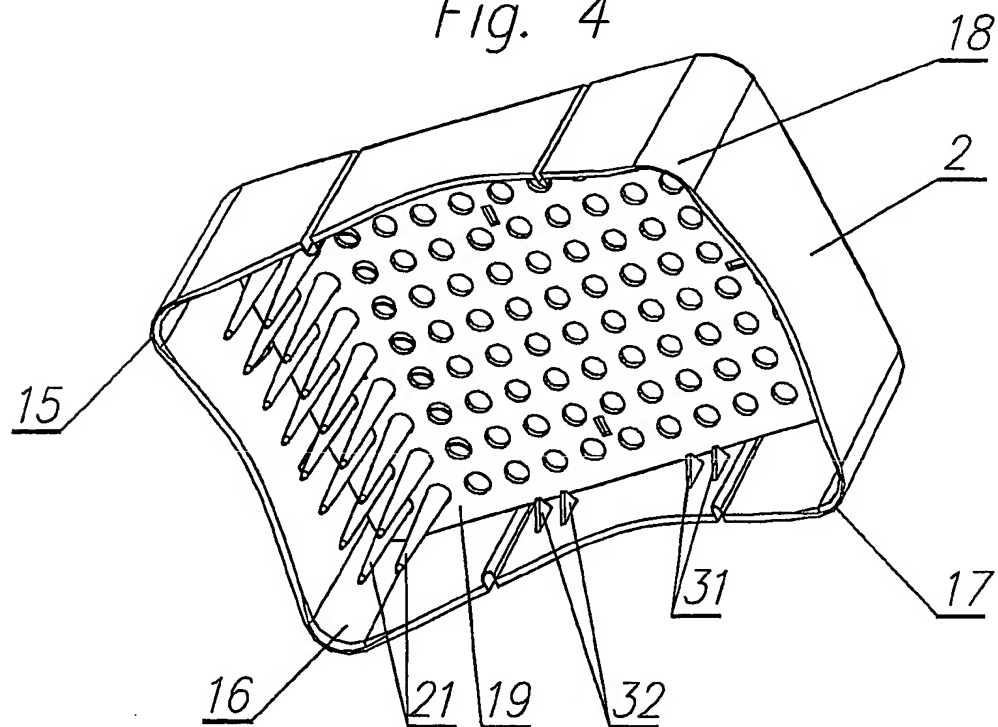


Fig. 5

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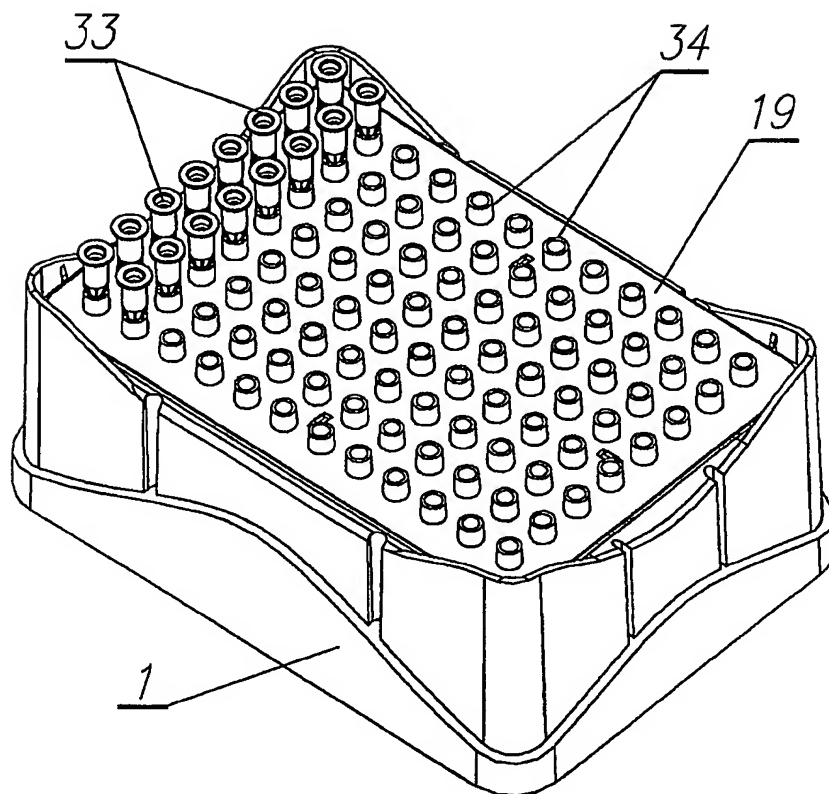


Fig. 7

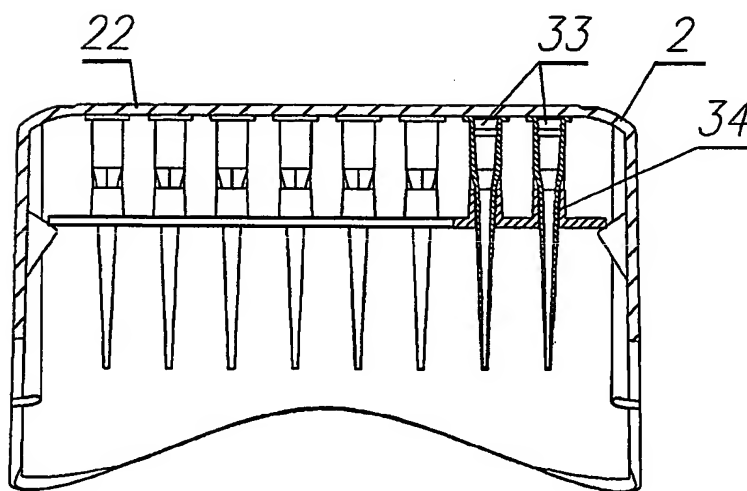


Fig. 8

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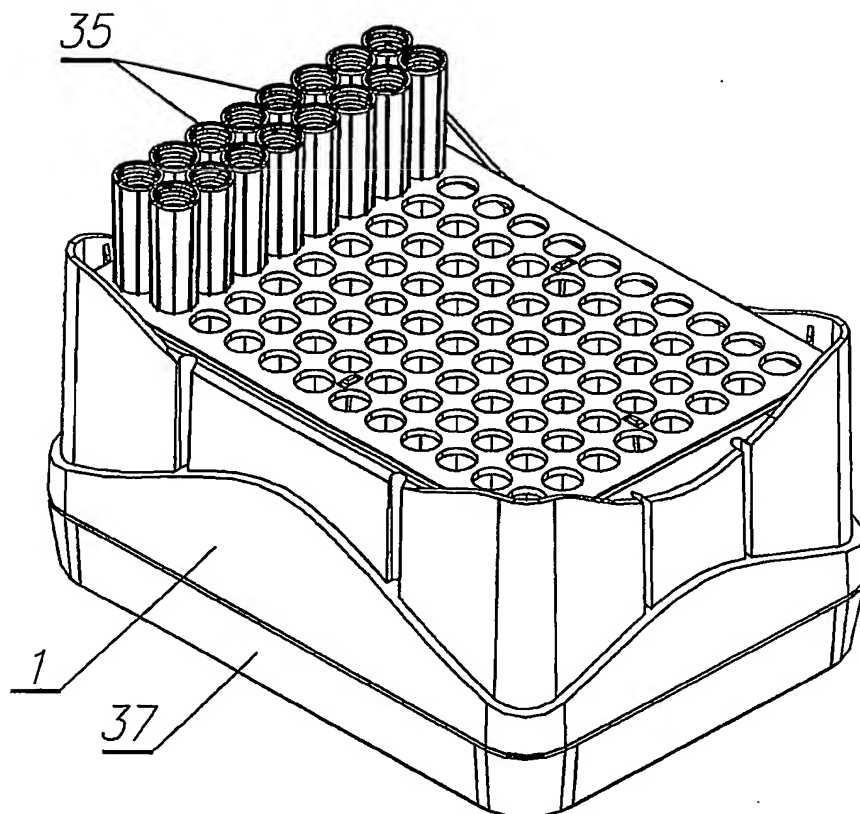


Fig. 9

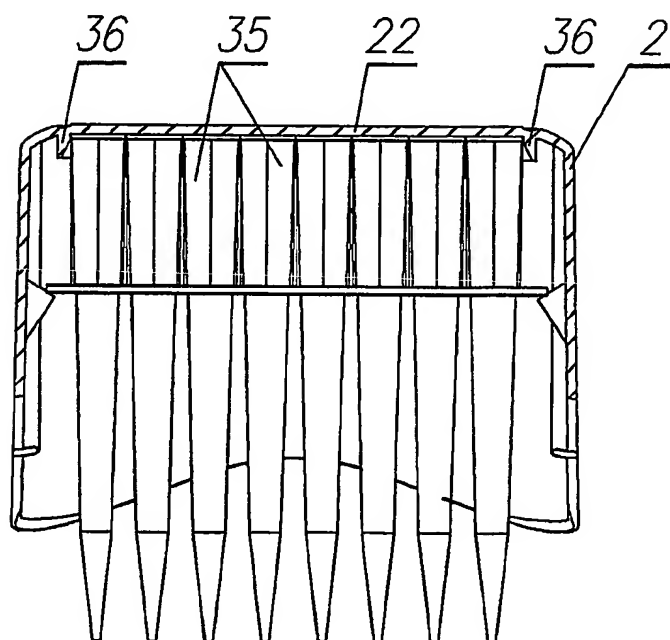


Fig. 10

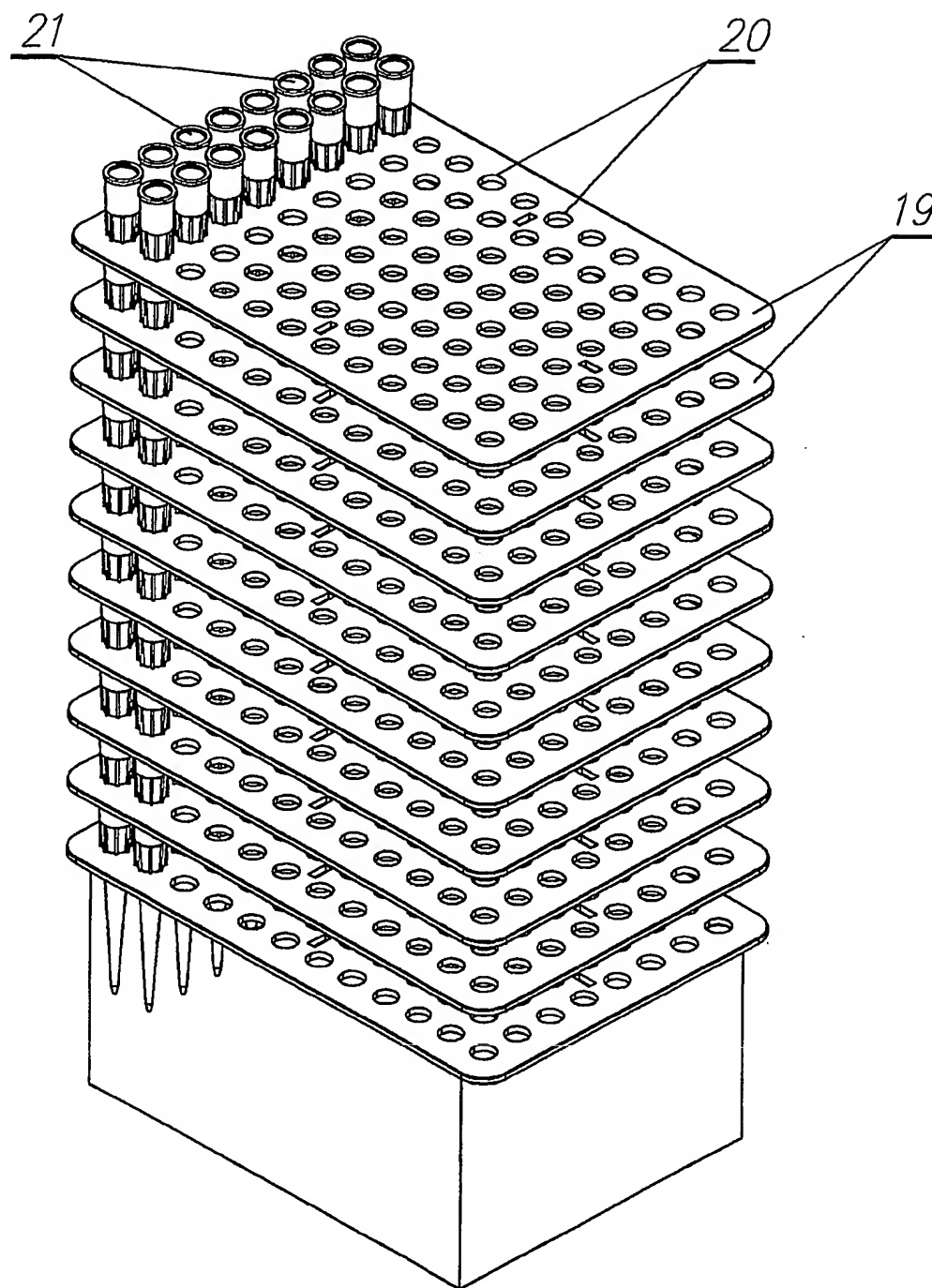


Fig. 11